IN THE CLAIMS:

Based upon the foregoing, Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

1. (Original) An optical switch comprising:

a plurality of optical fibers for use in transmitting optical signals;

a plurality of beam forming devices each having an optical aperture, each of said beam forming devices being optically associated with a corresponding one of said plurality of optical fibers, said fibers and beam forming devices being configured such that each of said beam forming devices can image an optical aperture of a corresponding one of said fibers onto the optical aperture of another one of said beam forming devices corresponding to another one of said fibers;

a plurality of beam directing devices, each of said beam directing devices being optically associated with a corresponding one of said plurality of optical fibers, said beam directing devices being operative to establish an optical connection between a first fiber of said optical fibers and a second of said optical fibers by directing beams from said first fiber to said second fiber and directing beams from said second fiber to said first fiber so as to permit bi-directional communication between said first and second fibers;

said beam directing devices further being operative for establishing said connection between said first and second fibers such that, at an optical aperture of each of said first and second fibers, any angle between an axis of a beam entering or exiting a respective one of said first and second fibers and an axis of said respective one of said

first and second fibers, is less than a numerical aperture of said respective one of said first and second fibers.

2. – 39. Canceled.

40. (Added) An optical switch as set forth in Claim 1, wherein each of said beam directing devices is a mirror rotatable about at least one axis.

41. (Added) An optical switch as set forth in Claim 40, wherein said mirror is embedded in a MEM chip.

42. (Added) An optical switch as set forth in Claim 1, wherein said plurality of optical fibers is arranged in an array facing a fixed mirror so as to enable interconnection between any pair of said fibers.

43. (Added) An optical switch as set forth in Claim 1, wherein said plurality of optical fibers is arranged in first and second arrays so as to enable interconnection between any fiber of said first array and any fiber of said second array.

44. (Added) An optical switch device for directing optical signals between ends of a plurality of optical fibers, said optical switch device comprising:

reflective means for reflecting an optical signal incident thereon at an angle determined by the orientation of said reflective means;

an array of a plurality of said reflective means; and

additional means for reflecting an optical signal between one of said reflective means of said array to a second one of said reflective means of said array;

wherein, when a combination of two of said reflective means of said array are in

respective predetermined orientations, an optical signal emitted from an end of one optical fiber is directed to an end of a second optical fiber by said combination.

45. (Added) The optical switch device of Claim 44 wherein said reflective means are positionable in a plurality of orientations.

46. (Added) The optical switch device of Claim 44 wherein said reflective means are rotatable about at least one axis of rotation to a plurality of orientations.

47. (Added) The optical switch device of Claim 44 wherein said reflective means are mirrors.

48. (Added) The optical switch device of Claim 44 wherein said reflective means include a pair of orthogonal axes of rotation about which said reflective means are rotatable to a plurality of orientations.

49. (Added) The optical switch device of Claim 44 wherein said additional means are a mirror fixed relative to said array.

50. (Added) The optical switch device of Claim 44 further comprising:

beam forming means for forming an optical signal into a focused beam associated with each optical fiber and disposed between the end of its associated fiber and said array such that an optical signal emitted from the end of its associated fiber is focused on a corresponding one of said reflective means of said array.

51. (Added) An optical switch for directing an optical signal between an first fiber end and a selected second fiber end of a plurality of output fibers, said optical switch comprising:

first focusing means, disposed in known spatial relation to the first fiber end, for receiving said optical signal from said input fiber end and forming a focused beam, wherein said

focused beam includes rays that converge to create an image of the first fiber on the second focusing means;

second focusing means is imaging the end of the second fiber onto the first focusing means;

beam directing unit, optically disposed relative to said focusing means for receiving said focused beam, for selectivity directing said focused beam relative to said selected second fiber end so as to optically connect said first fiber end and said selected output fiber end for transmission of said optical signal therebetween.

52. (Added) The optical switch of Claim 51 further comprising:

second focusing means, disposed in known spatial relation to the selected output fiber end, for receiving said focused beam from said beam directing unit and focusing said focused beam onto the selected output fiber end.

53. (Added) The optical switch device of Claim 52 wherein said first focusing means is a first lens having a first surface facing the input fiber end and a second surface facing opposite said first surface of said first lens, and said second focusing means is a second lens having a first surface facing the output fiber end and a second surface facing opposite said first surface of said second lens.

54. (Added) The optical switch device of Claim 53 wherein with D representing the effective aperture of said first and second lenses, u representing the distance between said first lens and the input fiber end and the distance between said second lens and the output fiber end, v representing the distance between said first and second lenses, NA representing the numerical aperture of the input and output fiber ends, and f representing the focal length of said first and second lenses, the following equations are satisfied:

$$D = 2\,u \tan(\sin^{-1}(N.A.)) + d$$

$$1/f = 1/v + 1/u$$

$$d/u = D/v$$

when a thin lens approximation is assumed.

55. (Added) The optical switch device of Claim 51 wherein said beam directing unit comprises a first reflector and a second reflector.

56. (Added) The optical switch device of Claim 55 wherein said reflectors are micro electro mechanical mirrors.

57. (Added) The optical switch device of Claim 56 wherein each of said mirrors is rotatable about at least one axis.